

AMENDMENTS TO THE CLAIMS

1. (Cancelled)

2. (Currently Amended) The method of claim ~~[[1]]~~ 4, wherein the multi-role driver and the helper drivers are operable to run in the WINDOWS Driver Model environment.

3. (Currently Amended) The method of claim ~~[[1]]~~ 4, wherein a role is determined according to a device type for which the multi-role driver is invoked and the extent of the stack at the point at which the multi-role driver is invoked.

4. (Currently Amended) ~~The method of claim 1,~~ A method used while building in processor memory a stack of device objects (DOs) representing a device, there being a multi-role driver for a plurality of roles at least one of which corresponds to the device, the method comprising:

registering a plurality of uni-role helper drivers so as to uniquely correspond to the plurality of roles, respectively, each helper driver mapping uniquely to one of the multiple roles of the multi-role driver, respectively; and

indirectly specifying a corresponding one of the multiple roles of the multi-role driver by specifying the helper driver mapped thereto.

wherein each of the multiple roles in the multi-role driver has a corresponding DOPush function, each DOPush function having been made available to be invoked by a code portion external to the multi-role driver.

5. (Currently Amended) The method of claim ~~[[1]]~~ 4, wherein each helper driver includes an AddDevice routine that invokes a corresponding DOPush function in the multi-role driver, or each helper driver points to the address of the corresponding DOPush function in the multi-role driver.

6. (Cancelled)

7. (Cancelled)

8. (Cancelled)

9. (Currently Amended) ~~The method of claim 8,~~ A method used while assembling in processor memory a stack of device objects (DOs) representing a device, there being a multi-role driver for a plurality of roles at least one of which corresponds to the device, the device having a corresponding physical device object (PDO), the method comprising:
providing a plurality of DOPush functions in a multi-role driver;
loading the multi-role driver into the memory so as to arrange for each of the DOPush functions to be directly invokable by a code portion external to the multi-role driver; and
invoking, externally to the multi-role driver, one of the DOPush functions, which includes passing the PDO of the device to the invoked DOPush function.

wherein the DOPush function is invoked externally by an AddDevice routine of a helper driver, or the PnP manager, if the helper driver does not have the AddDevice routine, after the PnP manager is pointed to the address of the DOPush function by the helper driver, the helper driver being registered uniquely for the role to which the DOPush function corresponds.

10. (Currently Amended) The method of claim ~~[[8]]~~ 9, wherein the multi-role driver is operable to run in the WINDOWS Driver Model environment.

11. (Currently Amended) The method of claim ~~[[8]]~~ 9, further comprising: registering neither the multi-role driver nor the DOPush functions in the registry of the operating system as having a role in assembly of a stack representing a device.

12. (Currently Amended) The method of claim ~~[[8]]~~ 9, wherein a role is determined according to a device type for which the multi-role driver is invoked and the extent of the stack at the point at which the multi-role driver is invoked.

13-14. (Cancelled)

15. (Cancelled)

16. (Currently Amended) The machine-readable code arrangement of claim ~~[[15]]~~ 19, wherein the multi-driver code portion and the helper driver code portions are operable to run in the WINDOWS Driver Model environment.

17. (Currently Amended) The machine-readable code arrangement of claim ~~[[15]]~~ 19, wherein a role is determined according to a device type for which the multi-role driver code portion is invoked and the extent of the stack at the point at which the multi-role driver code portion is invoked.

18. (Cancelled)

19. (Currently Amended) ~~The machine-readable code arrangement of claim 18, A~~
code arrangement on a machine-readable medium execution of which facilitates assembling in
processor memory a stack of device objects (DOs) representing a device, the machine-readable
code arrangement comprising:

a multi-role driver code portion which corresponds to the device, the multi-role driver
code portion having exported functions corresponding to the multiple roles of the multi-role
driver code portion, respectively;

a plurality of helper driver code portions; and

an installer code portion for registering the plurality of helper driver code portions so as to uniquely map to the multiple roles, respectively;

each helper driver code portion being operable to receive a corresponding PDO and pass the PDO to the multi-role driver code portion without attempting to attach to the stack a DO corresponding to the help driver code portion,

wherein the exported functions are DOPush functions and wherein each helper driver code portion includes an AddDevice routine code portion that invokes the corresponding DOPush function in the multi-role driver portion, or each helper driver code portion is operable to point to the address of the corresponding DOPush function in the multi-role driver code portion.

20. (Cancelled)

21. (Currently Amended) The apparatus of claim ~~[[20]]~~ 23, wherein the multi-role driver means and the helper driver means are operable to run in the WINDOWS Driver Model environment.

22. (Currently Amended) The apparatus of claim ~~[[20]]~~ 23, wherein a role is determined according to a device type for which the multi-role driver means is invoked and the extent of the stack at the point at which the multi-role driver means is invoked.

23. (Currently Amended) ~~The apparatus of claim 20,~~ An apparatus having memory in which is buildable a stack of device objects (DOs) representing a device attached to the apparatus, the apparatus comprising:

multi-role driver means for operating according to a plurality of roles;

a plurality of helper driver means registered so as to uniquely correspond to the plurality of roles, respectively, of the multi-role driver; and

means for selectively invoking the multi-role driver according to one of the multiple roles via invoking the corresponding helper driver mapped thereto,

wherein the multi-role driver means provides a plurality of DOPush functions corresponding to the multiple roles, respectively, each DOPush function having been made available to be invoked by a code portion external to the multi-role driver means.

24. (Cancelled)

25. (Original) The machine-readable code arrangement of claim [[24]] 27, wherein the multi-role driver and the helper driver code portions are operable to run in the WINDOWS Driver Model environment.

26. (Original) The machine-readable code arrangement of claim [[24]] 27, wherein a role is determined according to a device type for which the multi-role driver is invoked and the extent of the stack at the point at which the multi-role driver is invoked.

27. (Currently Amended) ~~The machine-readable code management of claim 24,~~A code arrangement on a machine-readable medium execution of which facilitates building in processor memory a stack of device objects (DOs) representing a device, there being a multi-role driver for a plurality of roles at least one of which corresponds to the device, the machine-readable code arrangement comprising:

a plurality of helper driver code portions:

a first code portion for registering the plurality of helper driver code portions so as to uniquely correspond to the plurality of roles, respectively, each helper driver code portion mapping uniquely to one of the multiple roles of the multi-role driver, respectively; and

a second code portion for indirectly specifying a corresponding one of the multiple roles of the multi-role driver by specifying the helper driver code portion mapped thereto,

wherein each of the multiple roles in the multi-role driver has a corresponding DOPush function, each DOPush function having been made available to be invoked by a code portion external to the multi-role driver.

28. (Currently Amended) The machine-readable code arrangement of claim [[24]] 27, wherein each helper driver code portion includes an AddDevice routine code portion that invokes a corresponding DOPush function in the multi-role driver, or each helper driver code portion points to the address of the corresponding DOPush function in the multi-role driver.